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COMMON ACRONYMS/ABBREVIATIONS USED IN CHAPTER 1

BCCWP – Buffalo Creek Clean Water Partnership
BMP – Best Management Practices
CMAP – Chicago Metropolitan Agency for Planning
CWA – Clean Water Act
DPR Planning Area – Des Plaines River Watershed Planning Area
DRWW – Des Plaines River Watershed Workgroup
HUC – Hydrologic Unit Codes
IDNR – Illinois Department of Natural Resources
Illinois EPA – Illinois Environmental Protection Agency
LCFPD – Lake County Forest Preserve District
LCHD – Lake County Health Department
SMC – Lake County Stormwater Management Commission
TMDL – Total Maximum Daily Load
UDPREP – Upper Des Plaines River Ecosystem Partnership
USACE – United States Army Corps of Engineers
USEPA – United States Environmental Protection Agency
USGS – United States Geological Survey

1 INTRODUCTION

1.1 WHAT IS A WATERSHED?

A **watershed** is the area of land drained by a river, stream, or other body of water (see Figure 1-1 for a diagram of a watershed system). Other common names given to watersheds include **drainage basins** and **catchments**.

As simple as the definition sounds, a watershed is actually a complex interaction between ground, climate, water, vegetation, and animals. In today's developed watersheds, other elements such as sewage, agricultural drainage, **impervious surfaces**, stormwater, and erosion can all be detrimental to the health of the watershed.

The health of a waterbody is a direct reflection of how the land in the watershed is used and managed. Some of the benefits of a healthy watershed are: improved water quality, fewer flooding problems, enhanced wildlife habitat, recreational opportunities, and better quality of life.

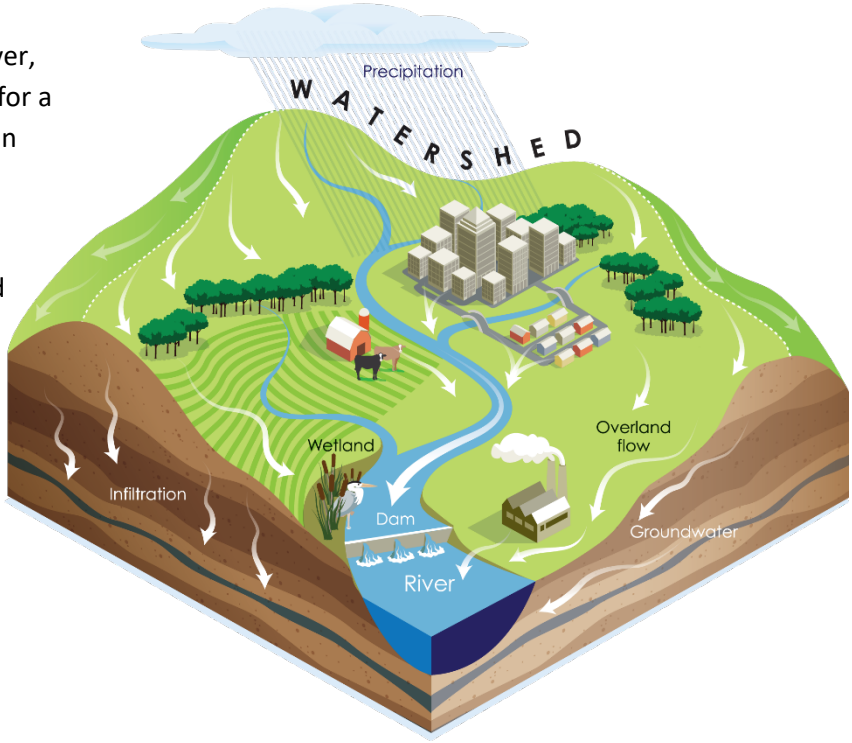

Figure 1-1: Diagram of a Watershed

WATERSHED: Land area that drains water to a given point, usually a river, stream or lake. The land area above a given point on a waterbody (river, stream, lake, wetland) that contributes runoff to that point is considered the watershed.

DRAINAGE BASIN: Synonymous with "watershed," though often used to describe the watersheds of larger rivers or hydrologic systems (e.g., the "Mississippi River drainage basin" or "Great Lakes drainage basin").

CATCHMENTS: Small unit of a watershed or subwatershed that is delineated and used in watershed planning efforts because the effects of impervious cover are easily measured, there is less chance for confounding pollutant sources, boundaries have fewer political jurisdictions, and monitoring/mapping assessments can be done in a relatively short amount of time. The 432 catchments in the DPR planning area have an average size of 0.5 square miles, with a range of 0.03 – 2.2 square miles.

SUBWATERSHED: A SMALLER BASIN WITHIN A LARGER DRAINAGE AREA THAT ALL DRAINS TO A CENTRAL POINT OF THE LARGER WATERSHED. THE 10 SUBWATERSHEDS IN THE DPR PLANNING AREA HAVE AN AVERAGE SIZE OF 23.5 SQUARE MILES, WITH A RANGE OF 2.8 – 50.9 SQUARE MILES. SEE CHAPTER 3, SECTION 3.4.1 FOR MORE INFORMATION ABOUT THE DPR PLANNING AREA 10 SUBWATERSHEDS.

IMPERVIOUS SURFACES: A surface that does not allow water to infiltrate to the soil layer, including pavement, rooftops, and roads.

1.1.1 WHY A WATERSHED-BASED PLAN?

Water is elemental to our lives. Plants and animals, including humans, are largely composed of water, and generally require clean water to survive. Our communities, food systems, energy sources, and countless products that we consume everyday are dependent upon water. Despite this dependence, water is often taken for granted until it negatively affects us, usually due to short supply, inundation, or pollution.

This watershed-based plan is important because it specifically addresses water-related issues in communities within the Des Plaines River watershed planning area. Clean and abundant water, healthy streams and lakes, and safety from flooding are important to residents and business and therefore play a significant role in the quality of life, health and economic vitality of our communities. Clean and healthy watersheds are assets that make communities more desirable for residents and businesses; however, flooding can damage property and result in local economic impacts. Lakes, rivers, and streams in the planning area provide recreational destinations for watershed residents as well as tourists and are a highly visible indicator of watershed health. These waterbodies support a diverse variety of water-dependent plants and animals and are critical to local ecosystems.

Water does not generally flow according to political boundaries. Consequently, we recognize the watershed as the appropriate scale to address most water resource issues, which often involves multiple political jurisdictions. The Des Plaines River watershed planning process brought together numerous watershed stakeholders to provide input towards the management and enhancement of water resources in the planning area. During this planning process, critical data was obtained from record flooding that occured in 2017, as well as a comprehensive water quality monitoring effort conducted on watershed streams. This watershed-based plan utilizes these sources of up-to-date information as well as historical data to provide a comprehensive summary of existing watershed conditions and trends. It recommends actions stakeholders can take to protect resources that are in good condition and restore those that have been degraded. As a resident, landowner, business or community official, you make a difference.

1.2 DES PLAINES RIVER WATERSHED PLANNING AREA

1.2.1 DES PLAINES RIVER WATERSHED

The Des Plaines River watershed covers 1,455 square miles (or 931,489 acres) in northeastern Illinois and southeastern Wisconsin. The Des Plaines River begins near Union Grove, Wisconsin and flows south through Racine and Kenosha Counties in Wisconsin and Lake, Cook, and Will Counties in Illinois. The river joins the Chicago Sanitary and Ship Canal in Lockport, Illinois and flows west through Joliet, before converging with the Kankakee River to form the Illinois River. The Illinois River then flows into the Mississippi River, which flows south to the Gulf of Mexico. The drainage area of the Des Plaines River Watershed was increased by 673 square miles when there was a diversion of Lake Michigan water through the Chicago Sanitary and Ship Canal and the Cal-Sag Channel in the early 1900's (Pescitelli, 2013). Since January 17, 1900, there has been limited diversion of water from Lake Michigan through the Chicago Sanitary and Ship Canal to the Illinois River (Healy, 1979).

1.2.2 DES PLAINES RIVER WATERSHED PLANNING AREA

The Des Plaines River Watershed-Based Plan covers 16% of the Des Plaines River watershed, or approximately 235 square miles (150,361 acres). Hereinafter referred to as the Des Plaines River (DPR) planning area, this area encompasses portions of central Lake County, Illinois; southern Kenosha County, Wisconsin; and northern Cook County, Illinois, with portions of 39 municipalities and 15 townships (see Figure 1-4), 240 miles of stream, 17,000 acres of wetland, and 53 named lakes. Figure 1-3 depicts the size and location of the Des Plaines River Watershed compared to the DPR planning area. The DPR planning area is comprised of eleven 12-digit HUCs (see Table 1-1).

The Des Plaines River Watershed-Based Plan is an "umbrella" watershed-based plan because the 235 square-mile planning area includes 10 subwatersheds. The following five watershed-based plans have been completed for six subwatersheds of the DPR planning area in Lake County: the Bull Creek/Bulls Brook Watershed Based Plan (2009), Indian Creek Watershed Based Plan (2009), North Mill Creek-Dutch Gap Canal Watershed-Based Plan (2013), Mill Creek Watershed and Flood Mitigation Plan (2014), and Buffalo Creek Watershed-Based Plan (2016).

Four subwatersheds do not have watershed-based plans completed: Newport Drainage Ditch, Upper Des Plaines, Lower Des Plaines, and Aptakisic Creek. This "umbrella" plan updates or completes watershed-based planning for all ten subwatersheds (see Figure 1-2 for the DPR planning area subwatersheds planning status as of March 2016). This umbrella plan also guides local stakeholders to implement best management practices (BMPs) that provide cost and pollution effective solutions to surface water quality impairments.

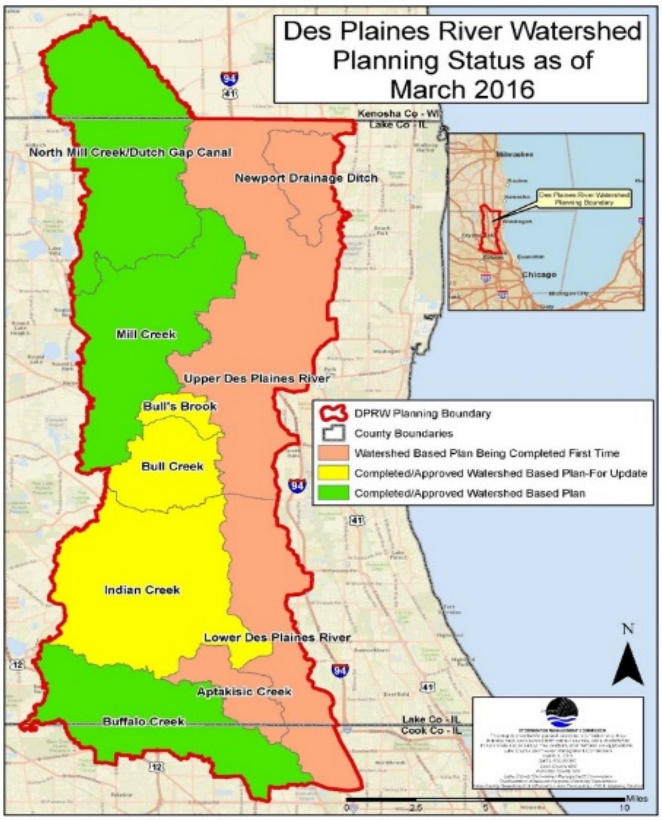

Figure 1-2: Des Plaines River Watershed Planning Status

NOTEWORTHY: HYDROLOGIC UNIT CODE (HUC)

A hydrologic unit can accept surface water directly from upstream drainage areas, and indirectly from associated surface areas such as remnant, noncontributing, and diversions to form a drainage area with single or multiple outlet points. Hydrologic units are only synonymous with classic watersheds when their boundaries include all the source area contributing surface water to a single defined outlet point. Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to twelve digits based on the six levels of classification:

- 2-digit HUC first-level (region)
- 4-digit HUC second-level (subregion)
- 6-digit HUC third-level (accounting unit)
- 8-digit HUC fourth-level (cataloguing unit)
- 10-digit HUC fifth-level (watershed)
- 12-digit HUC sixth-level (subwatershed)

Table 1-1: Des Plaines River Subwatersheds & 12-digit HUCS

SUBWATERSHED	12-DIGIT HUC	HUC NAME
North Mill Creek	071200040201	North Mill Creek
Mill Creek	071200040202	Mill Creek
Buffalo Creek	071200040502	Wheeling Drainage Ditch
Indian Creek	071200040501	Indian Creek
Bulls Creek	071200040302	Bull Creek – Des Plaines River
Bulls Brook	071200040302	Bull Creek – Des Plaines River
Upper Des Plaines River	071200040302 071200040301	Bull Creek – Des Plaines River Sterling Lake – Des Plaines River
Lower Des Plaines River	071200040503	McDonald Creek – Des Plaines River
Newport Drainage Ditch	071200040301 *071200040104*	Sterling Lake – Des Plaines River *Jerome Creek-Des Plaines River (only part of this HUC is in the planning area)*
Aptakisic Creek	071200040503	McDonald Creek – Des Plaines River

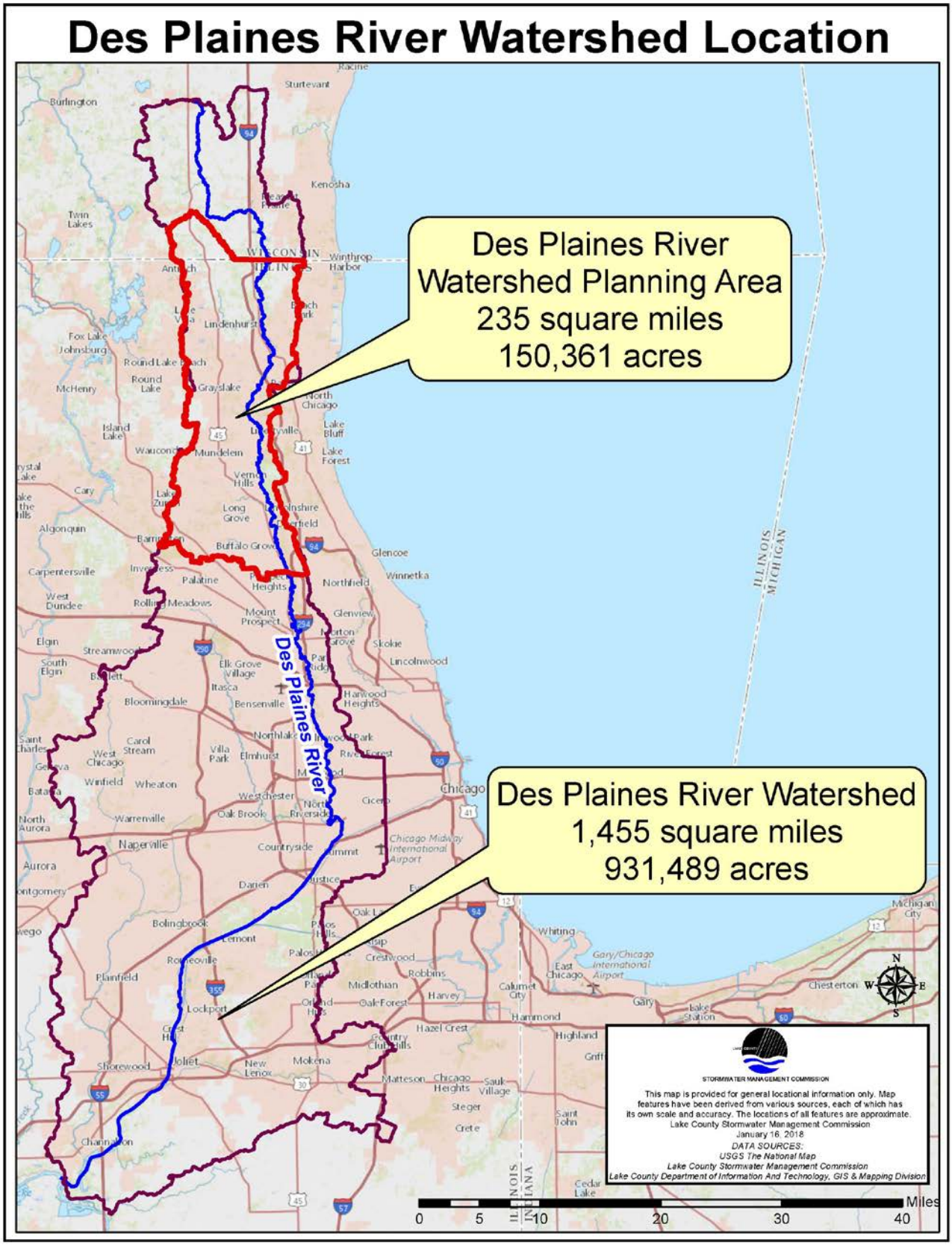

Figure 1-3: Des Plaines River Watershed Location Map

1.3 WATERSHED PLAN PURPOSE

Lake County Stormwater Management Commission (SMC) took the lead to develop a watershed-based plan for the DPR planning area. The purpose of this effort was to develop a plan to reduce the impacts of water pollution and flood damage; restore watershed lakes, streams, and wetlands to a healthy condition; and provide opportunities for watershed stakeholders to have a significant role in the process. This watershed-based plan does not address groundwater quality issues, focusing instead on stormwater and surface water runoff.

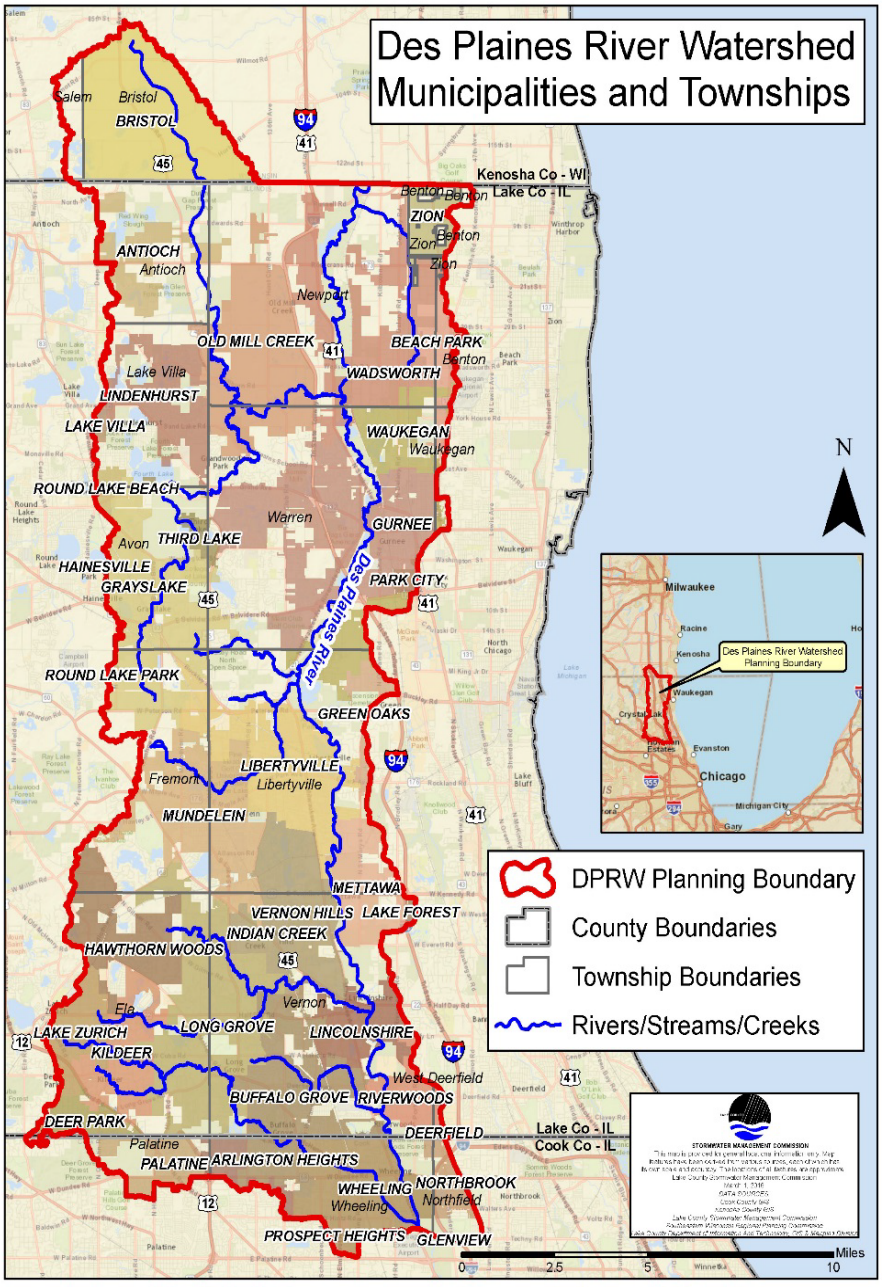

Figure 1-4: Des Plaines River Watershed & Des Plaines River Watershed Planning Area

A broad representation of watershed stakeholders participated in the planning process and developed and supported this plan. A significant objective of this planning effort and the implementation of the plan going forward is to return the 61 waterbodies in the DPR planning area that are listed as **impaired** on the 2016 Illinois 303(d) list of impaired waters to conditions that fully support their designated uses (Illinois EPA, 2016). Figure 1-5 depicts the waterbodies that are impaired in the DPR planning area.

This plan identifies BMPs to remedy or mitigate water quality impairment, flood damages, and the loss or degradation of natural resources.

The plan also recommends watershed stakeholders implement actions to preserve, manage, and restore natural resources, as well as prevent actions that will cause

IMPAIRED WATERS: The Clean Water Act requires states to identify waters that do not or are not expected to meet applicable water quality standards with current pollution control technologies alone.

or exacerbate unintended water quality and flood damage problems. Watersheds do not generally coincide with political boundaries, so watershed planning improves coordination and cooperation among communities and the land and water resources they share and impact.

1.4 WATERSHED PLAN REQUIREMENTS, PROCESS, AND ORGANIZATION

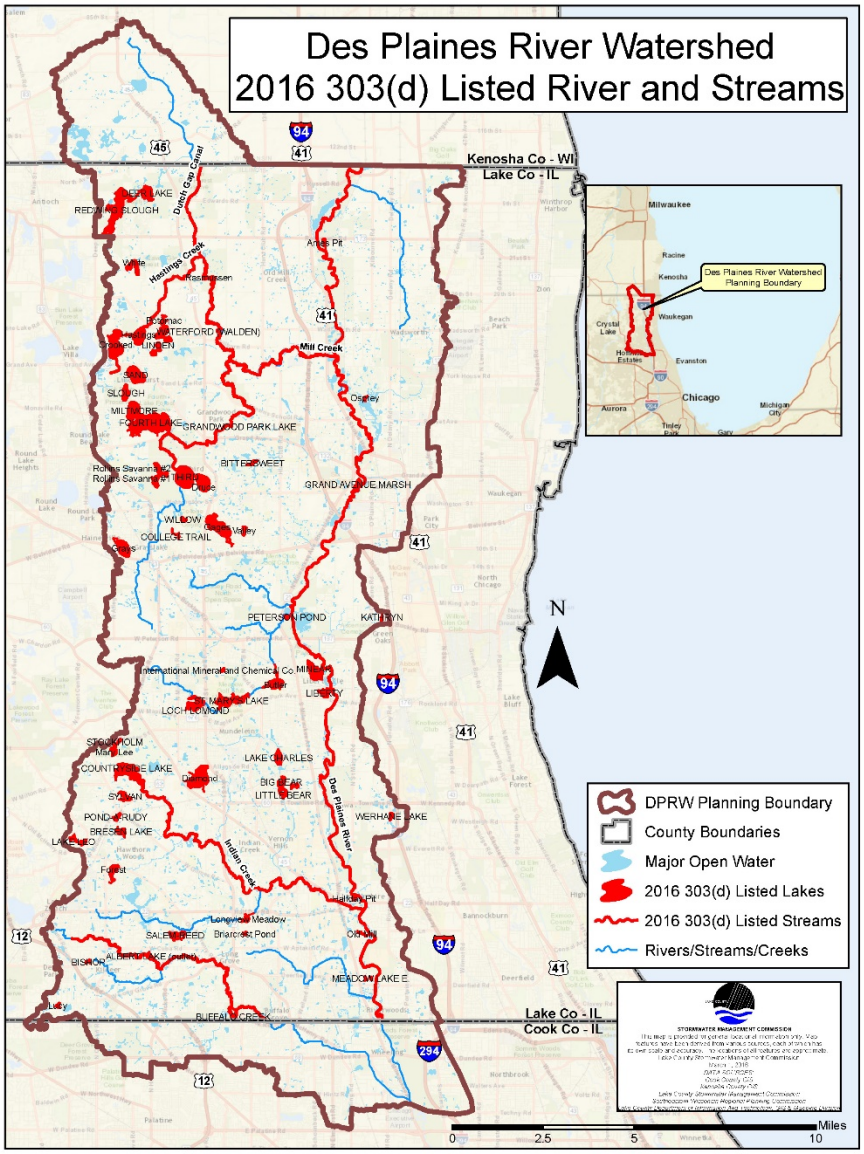

Figure 1-5: Des Plaines River Watershed 2014 303(d) Impaired Waters

The primary scope of this project is the development of a comprehensive watershed-based management plan for the 235-square mile DPR watershed planning area that identifies actions to improve water quality and reduce flood risks. The planning approach was designed to help stakeholders from multiple jurisdictions and with various interests to better understand and become engaged in the watershed. The desired planning outcome is to spur implementation of watershed improvement projects and programs that will accomplish the goals and objectives established in this plan. SMC worked with numerous stakeholders, including public agencies, local units of government, landowners, and private sector professionals with interests in the watershed. SMC engaged Northwater Consulting to assist in developing a watershed-based plan for the DPR planning area.

This Des Plaines River Watershed-Based Plan updated and incorporated the action plan recommendations of the five subwatershed watershed-based plans already completed. The most recent watershed-based plans for Mill Creek and Buffalo Creek are supplemented by this plan and contain new action recommendations within those watersheds. The Des Plaines River Watershed-Based Plan serves as a 10-year update to the three older watershed-based plans (North Mill-Dutch Gap Canal, Indian Creek, and Bull Creek-Bulls Brook) and satisfies the recommendations for periodic updates included in those watershed-based plans. These five watershed-based plan executive summaries and links to the watershed-based plans are included in the Appendices **(Appendix O**).

DES PLAINES RIVER WATERSHED-BASED PLAN - 2018

Development of the Des Plaines River Watershed-Based Plan was funded, in part, by the Illinois EPA through Section 319 of the Clean Water Act (CWA). Section 319 grants are also awarded to projects to protect water quality in Illinois. Projects must address water quality issues relating directly to nonpoint source pollution. Funds can also be used for the implementation of watershed management plans including the development of information/education programs and for the installation of BMPS. Section 319 funds give higher priority to applications that are implementing a site-specific action plan recommendation (project) in an approved watershed-based plan or TMDL implementation plan that meets the watershed-based plan requirements. A portion of the Section 319 funds does fund projects that are not recommendations in an approved watershed-based plan, but higher priority is allocated to projects within the watershed-based plans. The Des Plaines River Watershed-Based Plan follows Illinois EPA guidance and is designed to meet the nine elements required by the USEPA for a watershed-based plan.

NOTEWORTHY – USEPA'S NINE ELEMENTS OF A WATERSHED –BASED PLAN

1. Identification of the causes and sources, or groups of similar sources, of pollution that will need to be controlled to achieve the pollutant load reductions estimated in the watershed-based plan;
2. Estimate of the pollutant load reductions expected following implementation of the management measures described under number 3 below;
3. Description of the nonpoint source management measures that will need to be implemented to achieve the load reductions estimated under number 2 above, and an identification of the critical areas in which those measures will be needed to implement the plan;
4. Estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon to implement the plan;
5. Public information/education component that is designed to change social behavior;
6. Plan implementation schedule;
7. Description of interim, measurable milestones;
8. Set of criteria that can be used to determine whether pollutant loading reductions are being achieved over time;
9. Monitoring component to evaluate the effectiveness of the implementation efforts over time.

Pursuant to its mission and authority for stormwater management and watershed planning (55 ILCS 5/5-1062), SMC develops watershed-based plans and follows the adoption process outlined below (for Lake County portions of the planning area):

1. *Draft version of the watershed-based plan is submitted to the Illinois EPA, Illinois DNR-Office of Water Resources, and Chicago Metropolitan Agency for Planning (CMAP) for review*
2. *SMC Board approves a 30-day public comment through a public hearing and local publication*
3. *SMC revises the draft watershed-based plan based on comments received*
4. *Illinois EPA determines the plan meets the watershed-based planning guidance*
5. *The plan is brought before the Lake County Stormwater Management Commission & Lake County Board for adoption as an amendment to the Lake County Comprehensive Stormwater Management Plan.*
6. *SMC seeks community adoption of the watershed-based plan from the DPR planning area entities.*

1.5 PREVIOUS AND RELATED STUDIES AND PLANS

Floodplain, biological, habitat, water quality, and demographic/geographic data for this plan were compiled from several previous and concurrent studies of the watershed. This information was collected, analyzed, summarized, and supplemented with newly collected field data, and was then used to reach conclusions regarding the condition of the resources in the watershed. Field studies completed in association with this planning effort include: detailed stream and detention basin inventories performed by SMC and an expansive biological and water quality monitoring of the DPR watershed performed by the DRWW and the Illinois EPA. References for previous reports and studies and summaries of field data collected and reports compiled specifically for this planning effort are listed below in Table 1-2.

NOTEWORTHY – DRWW

The Des Plaines River Watershed Workgroup (DRRW) is a voluntary, dues-paying organization with a mission to bring together a diverse coalition of stakeholders to work together to preserve and enhance water quality in the Des Plaines River and its tributaries within Lake County, Illinois. The goal of the DRWW is to improve water quality in the Des Plaines River and its tributaries through monitoring, project and best practices implementation, and education and outreach that will achieve attainment of water quality standards and designated uses for the watershed. The DRWW officially formed in 2015 with the intent of improving water quality through a collaborative, locally led process.

Table 1-2: Previous Studies and Plans

PREVIOUS & RELATED STUDIES/PLANS	YEAR COMPLETED	AUTHOR/OWNER
Floodplain Studies	Newport Drainage Ditch (2003), Mill Creek (2014) & Bull Creek (2006)	Hey & Assoc., USGS, MWH Global, SMC, Bleck
Lake County Wetland Restoration and Preservation Plan	2018	SMC
Lake County All-Natural Hazards Plan	2017	SMC
Lake County Green Infrastructure Model and Strategy	2016	LCPFD
Lake County Flood Problem Areas Inventory	2016	SMC
Upper Des Plaines River & Tributaries (Des Plaines Phase II Report)	2015	USACE
Buffalo Creek Watershed-Based Plan	2015	SMC, BCCWP, Cardno, TRC Companies Inc., Bleck Engineering Company Inc. and Living Lands Conservation Company
Mill Creek Watershed and Flood Mitigation Plan	2014	SMC & Northwater Consultants
North Mill Creek-Dutch Gap Canal Watershed-Based Plan	2011	SMC & Northwater Consultants
Indian Creek Watershed-based Plan	2009	SMC, Applied Ecological Services, Inc. and Futurity, Inc.
Bull Creek-Brook Watershed-Based Plan	2009	SMC, Applied Ecological Services, Inc. and Depke Design
Des Plaines Strategic Subwatershed Implementation Plan	2004	IDNR/UDPREP

PREVIOUS & RELATED STUDIES/PLANS	YEAR COMPLETED	AUTHOR/OWNER
Des Plaines River Wetland Restoration Study	2001	Hey & Assoc., SMC
Lake County Lake Reports	2000	LCHD
Upper Des Plaines Flood Damage Reduction Study	1999	USACE
Upper Des Plaines River Area Assessment	1998	IDNR

1.6 USING THE PLAN

1.6.1 WHO SHOULD USE THIS PLAN?

This plan will be of limited use without the commitment of watershed stakeholders to improve, restore, manage, and steward watershed resources. Municipal and county agencies and elected officials, as the primary land use, development, and infrastructure authorities in the watershed, will have a significant amount of influence and responsibility for implementing this plan. These public agencies represent the interests of their constituents and are strongly influenced by every community resident or landowner. Therefore, each community member has the potential to influence the actions that occur in the DPR watershed through active participation.

State and federal agencies, elected officials, and private organizations, such as lake associations, homeowner associations, and private conservation organizations, will also play an important role. State and federal agencies can support the implementation of this plan by approving projects in a timely fashion, supporting projects with funding, and providing technical information, tools, and resources to assist local authorities and watershed organizations in their efforts. Private associations and organizations have the ear and influence of their members and can provide significant contributions to land and water protection. Individual watershed residents and landowners must also accept responsibility for managing their own land and water resources responsibly and for working with others to implement this plan.

All jurisdictions, organizations, businesses and institutions, private landowners, and residents will have to work together to successfully protect and restore the watershed. The power of water is immense, as anyone who has experienced flooding can attest. The flow of water also does not respect property lines or jurisdictional boundaries; therefore, everyone needs to share the long-term stewardship responsibility and the costs and benefits of watershed improvements.

The success of plan implementation will also be determined by the ability of stakeholders to organize to coordinate, communicate, and manage activities in the watershed. Watershed organizations are generally formed from the organizations and/or individuals who participated in the watershed planning process. Watershed organizations often become the drivers of implementing the watershed plan and provide educational outreach to the community. A watershed organization will be the primary mechanism to engage the general public in watershed activities, to support the implementation of the watershed plan, and to voice their concerns and celebrate their successes in restoring watershed resources.

1.6.2 How To Use This Plan

For those unfamiliar with watershed planning, this document may appear overwhelming. There are pages of information to navigate, containing numerous tables and maps reporting the condition of the watershed, and many costly recommendations that a lone individual cannot likely implement. These recommendations are for public agencies to consider. But there are also a number of straightforward actions that individuals can take to improve the watershed. Every action, no matter how small, when undertaken by many or key landowners can have a positive impact on improving the watershed. For a general understanding of what this plan is about, please read the Executive Summary, which also includes a list of top priority actions for the next ten years. For additional details, browse the table of contents and advance to the section you are interested in.

To find out…

- What this plan is intended to accomplish, read about the watershed issues, opportunities, goals, and objectives for improving watershed health and improving water quality in **Chapter 2**.
- Detailed information about watershed resources and conditions, read the section(s) of interest in **Chapter 3**.
- What the problems are facing the watershed, **Chapter 4** includes a summary and analysis of watershed problems that need to be addressed by the action plan.
- Detailed information about flooding, including the flood events, flood problem inventory, and strategies for flood damage reduction, turn to **Chapter 5**.
- What kind of actions can be taken to improve the watershed, the action plan in **Chapter 6 and Appendix N** includes a watershed-wide programmatic action plan that includes general recommendations; and a site-specific action plan directed to critical areas of the watershed that identifies actions that can improve water quality in specific areas. A web application has been created (https://tinyurl.com/ycthwx9x) that allows watershed stakeholders to access the site-specific action plan recommendations in the DPR planning area through a mapping tool.
- What kind of funding may be available to provide cost share for implementing watershed improvement projects, refer to the funding sources in **Chapter 7**.
- What sort of outreach and education is needed so that watershed stakeholders understand the watershed problems, their role in the watershed, and have the capability to implement the Action Plan, refer to **Chapter 8**. SMC will continue to coordinate the stormwater activities in the watershed planning area to improve water quality, reduce flood damage, and restore and enhance the natural drainage systems.

1.7 REFERENCES

Healy, R. W. 1979. River mileages and drainage areas for Illinois streams- Volume 1, Illinois except Illinois River Basin. U.S. Geological Survey, Water Resources Investigations 79-110.

Illinois Environmental Protection Agency Bureau of Water. “Illinois Integrated Water Quality Report and Section 303(D) List, 2016.” Water Resource Assessment Information and List of Impaired Waters, Vol. 1 Surface

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